REMARKS

Claims 1-45 are pending in the application. Claims 1, 4, 5, 6, 9, 15, 22, 26, 29, 34, 35 and 42 have been amended. The applicant respectfully requests reconsideration of claims 1-45 in view of the following remarks.

RESPONSE TO REQUEST TO AFFIRM PROVISIONAL ELECTION OF CLAIMS IN GROUP I

Claims 22-25 and 42-45 have been provisionally withdrawn from consideration, due to a provisional election, made without traverse, to prosecute the invention of Group I, identified as claims 1-21 and 26-41. In the instant action, the Examiner requests affirmation of the provisional election to prosecute the claims of Group I only. The Examiner indicates that the claims of Group II have separate utility and require restriction because they involve "splitting of 3-D objects into non-interacting object clusters, rendering all non-simple and non-interacting object clusters to a motion buffer, compositing the non-simple and non-interacting object clusters to a 2-D scene and merging the contents of two separate motion buffers, *all of which can be accomplished through use [of] any motion buffering technique, in addition to that recited in Group I.*" (Emphasis added.) In view of the Examiner's reason for restricting the claims of Group II, (i.e., claims 22-25 and 42-45), independent claims 22 and 42 have been amended to recite the properties of the motion buffer recited in the claims of Group I. As such, applicant believes the claims of Group II, as amended, preclude a restriction on the basis submitted by the Examiner in the instant Office Action. Consequently, applicant respectfully traverses the restriction requirement.

CLARIFICATION OF MEANING OF INDEPENDENT CLAIMS

Claims 1, 5, 6, 9, 26, and 29 have been amended to clarify their meaning. For example, claim 1, as originally filed, required a data structure configured to store the local properties of one or more 3-D objects, including each 3-D object's color, depth, coverage, transfer mode and

one or more of each 3-D object's rate of change of depth, and surface geometry information. The applicant intended claim 1 to recite a data structure configured to store each 3-D objects color, depth, coverage, transfer mode, and either (a) rate of change of depth, (b) surface geometry information, or (c) rate of change of depth and surface geometry information. That the Examiner correctly interpreted claim 1 in the manner intended by applicant is evidenced by the fact that the Examiner rejected claim 1 based on a combination of references that allegedly disclose a data structure configured to store a 3-D object's color, depth, coverage, transfer mode, and surface geometry information only.

The applicant notes, however, that pursuant to the recent Federal Circuit decision in *Superguide Corp. v. DirecTV Enters., Inc.* (Feb. 12, 2004), claim 1 as originally filed would be construed by the Federal Circuit to require a data structure that is configured to store each 3-D object's color, depth, coverage, transfer mode, rate of change of depth and surface geometry information. Consequently, to clarify its meaning and to insure that it is properly interpreted as it was intended to be, the applicant has amended claim 1 to recite "a data structure configured to store on a per pixel basis the local properties of one or more scan-converted 3-D objects, including each scan-converted 3-D object's color, depth, coverage, transfer mode, and rate of change of depth or surface geometry information." Independent claims 5, 6, 9, 26 and 29 have been similarly amended for the same reason.

<u>REJECTIONS UNDER 35 U.S.C. § 103(a)</u>

Claims 1-12, 16-18, 26-32, 35-38 and 40-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,990,904 to Griffin ("Griffin"), in view of U.S. Patent No. 5,809,219 to Pearce et al. ("Pearce"). Applicant respectfully traverses the Examiner's rejection of claim 1, as amended, for the reasons noted below.

Claim 1 recites a "motion buffer, implemented on a machine readable medium, comprising a data structure configured to store on a per pixel basis the local properties of one or more <u>scan-converted</u> 3-D objects to be composited to a 2-D scene including each <u>scan-converted</u> 3-D object's color, depth, coverage, transfer mode, and rate of change of depth or surface

geometry information." A scan-converted 3-D object is an object that has been rasterized, or scan-converted from a vector file format to a bitmap or raster file format. Thus, in claim 1, applicant recites a data structure that has been configured to store the local properties of one or more 3-D objects after they have been rasterized.

The Examiner reads the combination of Griffin and Pearce to disclose a data structure that stores on a per pixel basis, the color, depth, coverage, transfer mode and surface geometry information of a 3-D object. In particular, the Examiner reads Griffin to disclose a data buffer that stores the color, depth, transfer mode, and surface geometry information of 3-D objects, and relies on Pearce merely to disclose calculating and storing coverage information for animated 3-D graphical objects.

The applicant respectfully disagrees. While Griffin discloses that 3-D or vector objects have surface geometry information, Griffin fails to teach or suggest preserving the surface geometry information or rate of change of depth of 3-D objects after they have been scan converted. As applicant discloses in the instant specification, the surface geometry information of 3-D objects must be stored when they are scan-converted to correctly anti-alias any intersections between objects that are later composited together, while the rate of change of depth of 3-D objects must be stored when they are scan-converted to correctly motion-blur objects that are later composited and that are moving in the z-direction. See, application, p. 8, ll. 13-22 and p. 9, ll. 13-16. When Griffin scan-converts its 3-D objects, it stores the information needed to later composite the objects in a fragment buffer. Notably, Griffin fails to disclose storing surface geometry information or rate of change of depth in its fragment buffer. As Griffin itself notes:

> Each fragment buffer entry includes the following data:
>
> | R | G | B | α | Z | M | P | S |
>
> where R, G, B are the red, green, and blue color components, respectively, α is the alpha value which represents translucency of the pixel, and Z is the Z-value which represents the depth of the pixel from the eye point, M is a 4x4 pixel

> coverage bitmask for each pixel which is partially covered, P is a pointer to the next fragment buffer entry, and S is used to represent a fragment stencil.
>
> Col. 34, ll. 45-63.

Nor does Pearce disclose storing the surface geometry information or rate of change of depth of a 3-D object after it has been scan converted. Consequently, the combination of Griffin and Pearce fails to teach or suggests "a data structure configured to store on a per pixel basis the local properties of one or more <u>scan-converted</u> 3-D objects to be composited to a 2-D scene including each <u>scan-converted</u> 3-D object's color, depth, coverage, transfer mode, and rate of change of depth or surface geometry information," as recited in claim 1. Claim 1 is therefore patentable over the combination of Griffin and Pearce for at least this reason.

Claims 6 and 26 recite a method and associated computer program product, respectively, for creating a motion buffer, comprising "scan-converting each 3-D object's one or more object primitives into a plurality of pixel fragments corresponding to a plurality of pixels in a 2-D scene, wherein each pixel fragment is configured to store the local properties of a scan-converted object primitive including the object primitive's local color, depth, coverage, transfer mode, and rate of change of depth or surface geometry information." As discussed above, neither Griffin nor Pearce, alone or in combination, teach or suggest storing "color, depth, coverage, transfer mode, and rate of change of depth or surface geometry information" of scan-converted 3-D objects in a data structure. Consequently, claims 6 and 26 are patentable over the combination of Griffin and Pearce for at least this reason.

Similarly, claims 9 and 29 recite a method, and associated computer program product, respectively, for compositing a scan-converted 3-D object to a 2-D scene, the method comprising "receiving a motion buffer, the motion buffer containing the rendered local properties of the one or more scan-converted 3-D objects including each scan-converted 3-D object's color depth, coverage, transfer mode, and rate of change of depth or surface geometry information; and resolving the motion buffer." They too, are therefore patentable over the combination of Griffin and Pearce for at least the same reason that claims 1 and 6 are patentable over that combination of references.

In addition, claims 22 and 42 recite a method, and associated computer program product, respectively, for rendering a plurality of scan-converted 3-D objects to a 2-D scene, comprising "rendering all non-simple and non-interacting object clusters to a motion buffer, the motion buffer containing the rendered local properties of the one or more scan-converted 3-D objects including each scan-converted 3-D object's color depth, coverage, transfer mode, and rate of change of depth or surface geometry information." Claims 22 and 42 are therefore patentable over the combination of Griffin and Pearce for at least the same reason that claims 1 and 6 are patentable over that combination of references.

Finally, claims 2-5 depend from claim 1, claims 7-8 depend from claim 6, claims 10-21 depend from claim 9, and claims 23-25 depend from claim 22. Accordingly, these dependent claims are also allowable over the combination of Griffin and Pearce for at least the same reasons claims 1, 6, 9, and 22 are allowable over that combination of references. Similarly, claims 27-28 depend from and contain all the limitations of claim 26, claims 30-41 depend from claim 29, and claims 43-45 depend from claim 42. They are therefore also patentable over the combination of Griffin and Pearce for at least the same reason as claims 26, 29 and 42, as explained more fully above.

REQUEST TO INITIAL REFERENCES CITED IN 10/02 IDS

The applicant notes an IDS was filed on October 23, 2002 identifying three references cited in a foreign search report. The applicant hereby requests the Examiner to consider the pending claims in view of those references, and to kindly initial and return the form PTO-1449 in the next communication to indicate his consideration of those references.

All claims are believed to be in condition for allowance, which action Applicant respectfully requests. No fee is believed required for this response. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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